Abstract for Japan -129214

End of Result Set

L1: Entry 2 of 2 File: DWPI May 19, 1998

DERWENT-ACC-NO: 1998-342357
DERWENT-WEEK: 199830

TITLE: Tread for off-road tyres - comprises a base tread containing rubber component, carbon black and short fibres

PATENT-ASSIGNEE:

ASSIGNEE	CODE
SUMITOMO RUBBER IND LTD	SUMR

PRIORITY-DATA: 1996JP-0291910 (November 1, 1996)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 10129214 A	May 19, 1998		005	B60C011/00

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
JP10129214A	November 1, 1996	1996JP-0291910	

INT-CL (IPC): B60 C 11/00; B60 C 11/14; C08 K 3/04; C08 K 7/02; C08 L 21/00

ABSTRACTED-PUB-NO: JP10129214A
BASIC-ABSTRACT:

The tread for off-road tyre has a rubber block and a base tread which contains 100 pts.wt. of rubber component, 60-100 pts.wt. of carbon black, and 5-30 pts.wt. of short fibres.

USE - The tread is used for off-road tyres.

ADVANTAGE - The tread for off-road tyres has good gripping ability, anti-chunking ability, and anti-spalling ability.

CHOSEN-DRAWING: Dwg.1/3

TITLE-TERMS: TREAD ROAD TYRE COMPRISE BASE TREAD CONTAIN RUBBER COMPONENT CARBON BLACK SHORT FIBRE

DERWENT-CLASS: A95 Q11

CPI-CODES: A08-R01; A08-R03; A12-T01;

ENHANCED-POLYMER-INDEXING:
Polymer Index [1.1] 018 ; H0124*R Polymer Index [1.2] 018 ; ND01 ; Q9999 Q9256*R Q9212 ; K9892 ; K9416 ; B9999 B5367 B5276 ; K9905 ; K9449 Polymer Index [1.3] 018 ; R05085 D00 D09 C* 4A ; A999 A237 Polymer Index [1.4] 018 ; S9999 S1092 S1070 ; A999 A419

SECONDARY-ACC-NO:
CPI Secondary Accession Numbers: C1998-105578
Non-CPI Secondary Accession Numbers: N1998-268240

machine translation for Japan 10-12-2014

* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention relates to the tread used for an off-road tire.
[0002]
[Description of the Prior Art] The off-road tire used for game vehicles which run irregular grounds, such as a sandbox and rocks, such as a motocross and a rally, is asked for the performance of the outstanding endurance and outstanding grip nature these days when motor sports have won popularity.
[0003] However, since a rubber block exists in the tread pattern of an off-road tire, under a severe operating environment, defluxion (henceforth the "chunking") of the rubber block [itself] and the deficit (henceforth an "edge chip") of the edge portion of a rubber block take place. Although a means to increase the amount of the carbon black contained in tread rubber, and to make particle size of carbon black smaller can be considered in order to raise chunking-proof nature and edge-proof chip nature generally, in this case, tread rubber will become hard, and grip nature will fall.
[0004] On the other hand, as technology of reinforcing the tread for tires mechanically, the technology which blends a staple fiber with the rubber constituent which constitutes the tread of a tire is known (for example, JP,54-132905,A and JP,61-42936,B).
[0005] Moreover, the technology to which the frictional force in Hikami of a tread is made to increase is indicated by carrying out orientation of the staple fiber to JP,4-176707,A and JP,4-110211,A along with the hoop direction of a tire in the rubber constituent which constitutes the tread for tires. However, according to this technology, although the frictional force of a tire and the intensity of a hoop direction increase, sufficient chunking-proof nature required for the rubber block of the tread for off-road tires and edge-proof chip nature are not obtained.
[0006] Furthermore, the technology of carrying out orientation of the fibrous little antislipping agents, such as organic fiber, to the shape of a right angle altogether to a tread front face is indicated by JP,62-191204,A from the point to which the frictional force in the place on the snow of a tire and Hikami is made to increase. However, in order to combine a staple fiber in the right-angled direction to a tread front face altogether, a problem is in the intensity of the hoop direction of a tire. Moreover, there is no publication that it excels in the chunking-proof nature of a rubber block of a tread and edge-proof chip nature.
[0007] Thus, each attempt which is going to attain reinforcement of the conventional tread or the increase in frictional force by combination of a staple fiber had twisted the staple fiber for the means of making orientation carry out in the one direction substantially.
[0008]
[Problem(s) to be Solved by the Invention] In view of the above fact, this invention persons do orientation of the staple fiber to a hoop direction in the based red which constitutes the tread for off-road tires as a result of examination wholeheartedly. And if orientation of the staple fiber can be carried out to radial (henceforth "Z shaft orientations") from the center of a tire in a rubber block it finds out that not only the intensity about the hoop direction of the grip nature which may be the aforementioned Prior art, and a tire but the chunking-proof nature and edge-proof chip nature which are especially needed for the rubber block of the tread for off-road tires are obtained, and came to complete this invention
[0009] That is, the purpose of this invention is to deal in the tread for off-road tires which was excellent in grip nature, chunking-proof nature, and edge-proof chip nature, and was excellent also in the mechanical strength.
[0010]
[Means for Solving the Problem] this invention relates to the tread for off-road tires in which consists of a rubber constituent with which this tread contains the carbon black of the 60 - 100 weight section, and the staple fiber of 5 - 30 weight section to the rubber 100 weight section, and this staple fiber is carrying out orientation to radial from the center of a tire in the rubber block and which is carrying out orientation to the hoop direction of a tire in based red in the tread for off-road tires which has a rubber block and based red.
[0011] As for the height of a rubber block of the aforementioned tread, it is desirable that it is 2cm or more.
[0012] Moreover, about the aforementioned rubber block, it is desirable that the ratio of the tensile stress of the direction as for which the staple fiber is carrying out orientation, and the tensile stress of a direction perpendicular to this direction is 1.5 or more.

[0013]
[Embodiments of the Invention] In this invention, the tread for off-road tires has the rubber block 1 and the based red 2, as shown

in drawing 1 , and in the rubber block 1, the staple fiber 3 in the rubber constituent which constitutes this tread carries out orientation of it to radial, and is carrying out orientation to the hoop direction of a tire in the based red 2 from the center of a tire. When a staple fiber carries out orientation to the hoop direction of a tire in based red, the intensity of the hoop direction of the tread for off-road tires obtained becomes high. On the other hand, the chunking-proof nature of this rubber block and edge-proof chip nature improve by carrying out orientation to radial (Z shaft orientations) from the center of a tire in a rubber block.

[0014] You may consist of what is used for the usual tread for tires, for example, natural rubber (NR), butadiene rubber (BR), styrene butadiene rubber (SBR), etc. are raised, and the rubber component in this invention is independent, or may combine these arbitrarily, and may be used. It is still more desirable that consisting of a blend of the point of the outstanding endurance and outstanding grip nature to NR and SBR consists only of the point of desirable and higher grip nature to SBR.

[0015] although it is used from the former as carbon black in this invention in the field which is a tire and acetylene black, fur eggplant black, etc. are easy to be raised, it is still more desirable that it is the fur eggplant black from the point of the outstanding endurance and outstanding grip nature

[0016] It is desirable that it is 10-30nm from the point of excelling in reinforcement nature, as a particle size of carbon black, and is 10-20nm from the point of a high grip performance.

[0017] As the blending ratio of coal of carbon black, it is the 60 - 100 weight section from the point of sufficient reinforcement nature and sufficient endurance to the aforementioned rubber component 100 weight section, and it is desirable that it is the 80 - 100 weight section from the point of a high grip performance.

[0018] The staple fiber in this invention carries out ******** which the tensile strength of the rubber constituent which constitutes a tread is raised, and reinforces a tread, and raises the chunking-proof nature of a rubber block of a tread, and edge-proof chip nature. Although it is easy to be the conventional thing as the material, for example, nylon, polyester, an aramid, rayon, etc. are raised, and it is independent, or these may be combined arbitrarily and may be used, it is still more desirable to use nylon from the point of higher reinforcement nature.

[0019] About the length (L) of a staple fiber, it is desirable that it is 50-500 micrometers from the point of being 20-1000 micrometers and fully carrying out orientation from the point of dealing in sufficient intensity. Moreover, as for the ratio (ratio of length to diameter) of fiber length (L) and the diameter of fiber (D), it is desirable that it is 200-2000 from the point of being unable to give sufficient intensity for the tread obtained to the case of less than 200, but giving sufficient intensity.

[0020] the thing which is 5 - 30 weight section from the point that will not be able to deal in effect sufficient in under 5 weight sections to the aforementioned rubber component 100 weight section as the blending ratio of coal of a staple fiber, but the degree of hardness of the tread which will be obtained if 30 weight sections are exceeded will become high too much, and grip nature will fall, and is 20 - 30 weight section from the point of dealing in sufficient tensile stress is still more desirable

[0021] In addition, in the rubber constituent in this invention, it is a book about vulcanization accelerators, such as vulcanizing agents, such as sulfur, a zinc white, and stearin acid, etc.

[0022] Moreover, although it can deal in the rubber constituent in this invention by the conditions and method from the former in a field of the rubber constituent for tires, after mixing components, such as a rubber component and carbon black, by the Banbury mixer except for a vulcanization accelerator and sulfur, it is desirable to finish, scour and carry out the mixture, the vulcanization accelerator, and sulfur which are obtained with a roll, and to deal in a rubber constituent.

[0023] The tread for off-road tires of this invention has based red and the rubber block. In based red, orientation of the staple fiber is substantially carried out to the hoop direction of a tire, and it does so the effect that the intensity of the hoop direction of a tire becomes high. Moreover, in a rubber block, orientation of the staple fiber is substantially carried out to radial from the center of a tire, and it does so the effect of excelling in the chunking-proof nature of a rubber block, and edge-proof chip nature.

[0024] It is desirable to extrude from the aforementioned rubber constituent, using an extruder as the production method of the tread of this invention, and to create a tread. In order to prepare a rubber block portion, in case the tread rubber which extruded by the conventional method so that a staple fiber might carry out orientation to the hoop direction of a tire at the time of the knockout of tread rubber, and was subsequently extruded is inserted in a mold and vulcanized, a rubber flow is caused in the portion of a rubber block, and the staple fiber under rubber block carries out orientation to radial, i.e., Z shaft orientations, from the center of a tire.

[0025] In this case, so that it may have the grip nature in which the tread a staple fiber carries out [the tread] orientation to radial, and by which it is obtained from the center of a tire in a rubber block was more excellent And the height of the point that it is inferior to chunking-proof nature if the height of a rubber block is too high to the aforementioned rubber block is 2-3cm. When a block is too high and it is inferior to chunking-proof nature, when it exceeds 3cm, and it is less than 2cm, it is desirable that it is 2.0-2.5cm from the point that a staple fiber does not fully carry out orientation.

[0026] It is still more desirable that it is 1.5-3.0 and is 1.5-2.0 from the point that will become hard too much with rubber and a grip will fall about the rubber constituent which constitutes the rubber block of the tread of this invention if the ratio of the tensile stress of the direction as for which the staple fiber is carrying out orientation, and the tensile stress of a direction perpendicular to this direction exceeds 3.0 the more although it can deal in sufficient chunking-proof performance the more a ratio is large.

[0027]

[Example] Although an example is used for below and this invention is explained to it, this inventions are not these things limited to seeing.

[0028] the blending ratio of coal shown in one to example of manufacture 6 table 1 -- SBR and carbon black (ISAF grade --) mean-particle-diameter: -- 20nm and a staple fiber (product made of nylon, and length: -- 100 micrometers) After mixing

ratio-of-length-to-diameter=500 for 4 minutes by the 1.7l. Banbury mixer, The mixture, the sulfur 1.5 weight section, and the vulcanization-accelerator (N-cyclohexyl-2-benzo thiazyl-sulfenamide (CBS)) 1.5 weight section which were obtained are finished using the 8 inches mixing mill for an examination. The rubber constituents 1-6 for dealing in the tread for off-road tires were obtained.

[0029] Subsequently, the tire size 110 / off-road tires 1-6 of 100-19 which consist of a tread which has the rubber block height shown in Table 1, respectively by the usual MC-X tire manufacture method were obtained using these rubber constituents 1-6.

[0030] [The evaluation method]

Ratio of tensile stress About the rubber constituent which constitutes a tread, it asked for the ratio of the tensile stress of the direction as for which the staple fiber is carrying out orientation, and the tensile stress of a direction perpendicular to this direction by measuring the tension modulus of each direction using Oriental Precision equipment Factory straw graph-T tension tester. A result is shown in Table 1.

[0031] Subsequently, the rear wheel was equipped with the obtained tires 1-6, the 2km motocross course was around gone 1 round in 250 cc MOTOKUROSSA, and the following evaluations were performed.

[0032] Chunking-proof nature The number of the blocks with which the number and crack of a block which flew from the appearance of a tire produced the above-mentioned course after the 1-hour run in order to evaluate the chunking-proof nature of a rubber block of the obtained tread was counted, O and one case were evaluated for zero case, and ** and four or more cases were evaluated for O and 2-3 cases as x. A result is shown in Table 1.

[0033] Edge-proof chip nature Although the acquired rubber block 1 almost has the edge of the angle of 90 degrees like drawing 2 , as shown in drawing 3 , it produces the edge chip 4 by run. Then, in order to evaluate the edge-proof chip nature of a rubber block of the obtained tread, the height of h [in / drawing 3 / for the above-mentioned course] was measured after the 1-hour run. O and the case of 0.5cm or more less than 1cm were evaluated for the case of 0cm or more less than 0.5cm, and ** and the case of 1.5cm or more were evaluated for O and the case of 1cm or more less than 1.5cm as x. A result is shown in Table 1.

[0034] Grip nature The above-mentioned course was carried out 10 round, the lap time was measured, the average time of high order 3 lap was made into the lap time of each tire, and this lap time estimated grip nature. It is shown that grip nature is so good that a lap time is quick. A result is shown in Table 1.

[0035]

[Table 1]

表　1

	ゴム組成物1	ゴム組成物2	ゴム組成物3	ゴム組成物4	ゴム組成物5	ゴム組成物6
SBR(1)（重量部）	100	100	100	100	100	100
カーボンブラック(2)（重量部）	80	80	80	80	80	80
短繊維（重量部）	0	10	20	30	10	10
ブロックの高さ（cm）	2.0	2.0	2.0	2.0	1.5	2.5
引張応力の比	1.0	1.5	2.0	2.5	1.2	1.8
耐チャンキング性	×	△	○	◎	△	△
耐エッジ欠け性	×	△	○	◎	○	○
グリップ性（秒）	130	140	150	160	160	125

(1) 住友化学工業（株）製SBR1500
(2) 三菱化学（株）製ダイヤブラックI（ISAFグレード）

[0036]

[Effect of the Invention] According to this invention, it can deal in the tread for off-road tires excellent in grip nature, chunking-proof nature, and edge-proof chip nature.

[Translation done.]